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Some Wartime Agricultural Problems in the Soviet Union

by **D. N. PRIANISHNIKOV***

During the war the attention of Soviet agricultural scientists was naturally focused on problems raised by the war. The evacuation of vast masses of population to the east was accompanied by a migration of crops to the new regions (for example, sugar beet to Central Asia). This raised the question of starting new fertilizer industries. Many scientists, too, had to change their places of residence and were able to familiarize themselves with agricultural conditions in parts of the country where they had never been before.

At the time of the evacuation of Moscow in the latter part of October 1941, the Timiryazev Agricultural Academy (the institution at which the writer was working) was sent to Samarkand, in Uzbekistan (Uzbek Republic). Samarkand already had two small colleges, and, when these were called upon to accommodate five others that were evacuated from Moscow, conditions for laboratory work were naturally cramped. For that reason, a decision was made, on my part, to divert my research work into channels of immediate practical utility—such as problems of local agriculture and field experiments.

Cotton

Uzbekistan is the principal cotton-growing region in the Soviet Union. Nine hundred thousand hectares (2.2 million acres) are planted to this crop. But cotton is grown only on irrigated land in the oases dispersed among the deserts, and the crop area is determined not so much by the amount of land as by the quantity of water available. Owing to climatic conditions, the cotton zone in the Soviet Union is far smaller than that in the United States; hence, the necessity for giving cotton the maximum space in rotations.

The success of cotton cultivation rested upon a basis which, in wartime, was becoming insecure; namely, on mineral fertilizer, with only a very restricted use of animal manure. The relation of cotton-crop yield to quantity of mineral fertilizer used may be seen from the following figures:

	1934	*1935*	*1936*	*1940*
Fertilizer used:				
Kgs. per ha	166	247	570	546
Lbs. per acre	148	220	509	487
Crop yield:				
Seed cotton (qtls. per ha)	7.9	11.6	16.2	17.0
Lint cotton (lbs. per acre)	226	331	462	485

Thus, with the increase of mineral fertilizer, the cotton yield per land unit in the period 1934–40 more than doubled.

But analysis of the figures showed that in respect to the amount of nitrogen restored to the fields by means of animal manure, Uzbekistan stood far below any Western country. Even in countries where the nitrogen industry is most highly developed, manure takes first place as a supplier of nitrogen in agriculture, and mineral fertilizer second place. In Uzbekistan the reverse is true. Thus, of every hundred parts of nitrogen withdrawn by crops, there were returned:

	By manure	*By mineral fertilizer*
In Germany	42 parts	22 parts
In Usbekistan (1940)	20 parts	55 parts

These ratios are all the more paradoxical in view of the fact that in Germany only 10 percent of the arable area is sown to clover mixtures; whereas in Uzbekistan 25 percent of the irrigated area is sown to alfalfa, which in that climate yields four cuttings a year and should provide forage requirements and therefore manure.

A closer analysis of Uzbekistan farming revealed the cause of the shortage of manure. The nitrogen in the liquid excrement mostly went to waste owing to lack of straw, grain crops having been excluded from the crop rotation on irrigated land in order to provide more space for cotton. They were imported from Siberia by a railroad specially constructed for the purpose (the Turkestan-Siberia railroad—

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For a discussion of Prianishnikov's work in the biochemistry field see:

CHIBNALL, ALBERT CHARLES. PROTEIN METABOLISM IN THE PLANT. 295 pp. New Haven. 1939.

VICKERY, HUBERT BRADFORD, PUCHER, GEORGE W., WAKEMAN, ALFRED J., and LEAVENWORTH, CHARLES S. CHEMICAL INVESTIGATIONS OF THE TOBACCO PLANT VI. CHEMICAL CHANGES THAT OCCUR IN LEAVES DURING CULTURE IN LIGHT AND DARKNESS. Conn. Agr. Exp. Sta. Bul. 399, pp. [757]–832, illus.

Turksib). The transportation of straw for distances of 1500–2000 kilometers (932 to 1,243 miles) was, however, not rational. It made the proper preparation of manure impossible; the liquid excrement, into which most of the nitrogen of alfalfa hay passes, flowed away or rapidly decomposed (owing to the hot climate), and the nitrogen fixed from the air by the alfalfa was (with the exception of the residue in the roots) lost in the form of ammonia.

Theoretical calculations (based on the proportion of area under alfalfa to area under cotton) showed that for every hectare of cotton planted there should be 80 kilograms (71 pounds per acre) of nitrogen available from the manure of alfalfa-fed animals. Actually, however, the cotton fields received in the form of manure only 15 kilograms of nitrogen per hectare (13 pounds per acre).

Naturally, the full 100 percent of the nitrogen contained in fodders can never be brought to the fields, but to tolerate such losses any longer, in view of the prospect of supplies of mineral fertilizer being cut off or substantially reduced by the war, was impossible. Accordingly, before the war might have a depressing effect upon the cotton yield, the prompt introduction of grain crops on cotton fields was advocated by the writer. The advisability of having, instead of a 100-percent area under cotton but with nitrogen-less farming, only 75 percent under cotton but with the fields well fertilized with properly prepared manure was pointed out, as well as the additional advantage that the population would be less dependent upon cereals brought from afar.

This proposal was all the more expedient because of the fact that in Uzbekistan two crops of grain can be obtained annually from one and the same area. Around Samarkand winter barley is harvested by the first of July, and in Turkmenistan and Tajikistan by May 15, after which there is plenty of time to plant and gather a crop of early ripening corn, mung beans, chickpeas, potatoes, turnips, etc. The following crop rotation was, therefore, recommended: 1st, 2d, and 3d years—alfalfa; 3d, 4th, and 5th years—cotton; 6th year—cereal (two crops); 7th and 8th years—cotton.

In this rotation, cotton occupies only five-eights of the land instead of three-fourths, but the farm, on the other hand, obtains straw. The increase in yield, following the more plentiful use of manure, should compensate for the reduction in area. The gross cotton harvest should show no reduction, and two crops of cereals would be a clear gain.

The subsequent rotation should include, besides alfalfa, 4 years of cotton and 2 of grain (four crops). This would produce still more straw, and consequently manure needed to increase cotton yields. The cotton output depends not only upon area but upon area multiplied by yield, and the latter, with proper use of fertilizer, can easily be doubled.

These missionary efforts were successful. The first cereal crops appeared on irrigated land in 1942 (about 25,000 hectares or 62,000 acres), but even better results were obtained when the agricultural plan was drawn up for 1943, when out of the total cotton area of 920,000 hectares (2,274,000 acres) in Uzbekistan, 200,000 hectares (494,000 acres) were set aside for cereals—not counting 76,000 hectares (188,000 acres) for sugar beet.

Sugar Beets

At a first glance, it might appear unwise to divert land from such a valuable crop as cotton—whose cultivation is confined to a strictly limited climatic zone—to sugar beet, which can be grown even in Siberia. But on closer examination, the introduction of sugar beet in the cotton areas was found to be welcomed, since it yields abundant fodder (green tops and beet pulp) and, consequently, manure, which restores to the soil the nutritive substances withdrawn by the crop. It does not exhaust the soil, whereas cotton absorbs nutritive substances and returns nothing. Furthermore, beet opens up new prospects in crop rotation. It permits the introduction of winter crops, since it is cleared from the fields in September and October. Cotton, on the other hand, occupies the fields until December, which makes impossible the sowing of winter crops thereafter. Yet it is winter grain—ripening as it does early the following year—which makes second crops possible.

There were excellent prospects for the development of sugar beet in the irrigated areas of the south, where it yields a crop two or three times higher than in the Ukraine. Therefore, my recommendation was that several variations of the crop rotation be used in Uzbekistan, all including beet and grain, particularly the following: 1st, 2d, and 3d years—alfalfa; 4th and 5th years—cotton; 6th year—sugar beet, followed by a winter crop; 7th year—winter crop, followed by a spring crop; 8th and 9th years—cotton.

Although cotton in this rotation is grown only 4 out of the 9 years, instead of the usual 6, it obtains more manure, and the yield should be high enough to overcompensate for the reduction in area. Furthermore, grain and sugar are obtained. In localities adjacent to sugar refineries the proportion of beet will naturally increase at the expense of cotton, and the former aggregate harvest of cotton cannot be expected.

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In addition to early spring planting of sugar beet for the refineries, its cultivation as a second crop, following the clearing of a winter crop, or as a catch crop, was also recommended by the writer. As previously stated, in Uzbekistan, winter barley is harvested (around Samarkand) between May 15 and the first of June. This makes it possible to plant beet and obtain a yield equivalent to two-thirds of a spring-planted crop; or, better still, to plant the beet in the spring in between the rows of winter barley. Beet grows very well under cover of a top crop and makes even faster progress when the latter has been removed. Beet so grown may have great value as food and fodder, replacing potatoes, which suffer from the hot Uzbekistan summer. In this way 40 metric tons (44 short tons) of roots per hectare (2.5 acres) may be obtained, which is equivalent in dry substances to 10 tons of grain. A beet catch crop may therefore yield four times the nutriment of a grain crop. And even after the late beet a winter crop may still be sown.

As doubts were expressed regarding the feasibility of preserving sugar beet in clamps during a southern winter, my advice was to dry the beet in cossettes—as is practiced in Italy.[1] But, whereas coal and oil are used in that country for drying purposes, my suggestion was to take advantage of the sun's heat, which in Central Asia is more intense than in Italy; also, rains do not fall there until November.

The original assumption was that special sun-drying apparatus would be required, but actualities surpassed my most optimistic expectations. The sliced beet, spread out in the morning in a layer of 5 kilograms per square meter (about 1 pound per square foot), dries in the heat of Central Asia within 8 or 10 hours to a content of 93 percent of dry substance and 62 percent cane sugar, without the latter undergoing inversion. As beet planted in March attains a sugar content of 17 percent by August, and as August is a very hot month, with absence of rain guaranteed, a whole month at least of dry weather may be relied upon for drying purposes. After small-scale tests, an experiment in sun-drying was made in one of the Samarkand collective farms on an area of half a hectare (about 1.25 acres), and the collective farmers soon acquired the knack.

If this method is to be adopted on a wide scale, however, beet-slicing machinery adapted for use on collective farms will have to be devised. Drying the beet, which reduces it to one-quarter of its weight, facilitates transportation to the refineries and, moreover, will enable the latter to work all the year round instead of seasonally.

Other suggestions were also made by me, which were designed to keep refineries employed in months when the beet begins to lose its sugar. One was the recommendation that another sugar-bearing plant, the Jerusalem artichoke, be used as raw material.

The tubers of this perennial stand the winter well even in the soil around Moscow, where they might be used as an early spring vegetable as well as a valuable cattle fodder before the grass has begun to sprout. But in Central Asia, where the soil does not freeze, the artichoke may be gathered all through the winter. It is much more easily and cheaply cultivated than the sugar beet and keeps better in the soil than in cellars. The refineries may therefore be recommended to work from August to the end of October on beet dug and carted straight from the field to the refineries; in November and December on beet stored in clamps; and from January to the middle of April on Jerusalem artichoke, which yields a fructose sirup sweeter than potato molasses. Most of the machinery of a refinery can be used for the extraction of sugar from the artichoke.

A further recommendation was to multiply sugar-beet seed in 1 year instead of 2. For this purpose, my suggestion was that seed gathered in July 1942 in Kazakhstan be brought to Uzbekistan in the south and planted in August of the same year as a catch crop, which should be hoed over but not dug up, thus saving the expense of harvesting and winter storage (as well as avoiding the risk of spoilage owing to the warm climate). In the spring the work of planting out the beets is eliminated, and all that is needed is the usual cultivation. (Acquaintance with this method was made in 1933 during a visit to Denmark, where the beet is planted for seed during the sowing period of the winter crop.)

Fertilizers

The accumulation of sugar in the beet largely depends upon suitable applications of mineral fertilizer (especially phosphates), and the question arose of creating a superphosphate industry in Central Asia. Nitrogen fertilizers were already being produced in these parts before the war, but not superphosphate. It was manufactured in the European part of the Soviet Union, the raw material being apatite mined in the Kola Peninsula. Thus, one of the chief component parts of superphosphate had to be transported by rail some 5,000 kilometers (about 3,100 miles), and the other component—sulphuric acid—had to travel about 4,000 kilometers (about 2,500 miles) before

[1] Ed. note: For a description of the Italian practice, see Facts about Sugar 24: 322, 1929.

reaching the cotton zone (and now the sugar-beet zone) of Central Asia. Rail communication with the Kola Peninsula was cut off during the war, but even in peacetime such an arrangement is economically unprofitable. Fortunately, just before the war large deposits of phosphorites were discovered in the Karatau Mountains, in southern Kazakhstan.

The war broke out before measures could be taken to exploit these deposits, but when Central Asia was cut off from the European superphosphate plants the question arose in all its urgency. The writer took part in drawing up a memorandum which was submitted to the governments of three neighboring republics, since the superphosphate plants were needed chiefly in Uzbekistan, the phosphorite deposits were in Kazakhstan, and deposits of raw material for the manufacture of sulphuric acid (pyrites) were in a third republic—Kirghizia. In spite of wartime difficulties, a spur line 90 kilometers (56 miles) long was laid from Djambul to a spot where the phosphorites could be mined in open workings, and the building of a plant was undertaken in Kokand (in the heart of the cotton belt), which, by decision of the Council of Defense, was to start operation in August 1944.

The long-drawn-out war caused a drain on draft animals and mechanical traction power, and difficulties were experienced in carting manure to the fields. The writer therefore proposed a form of fertilizer which is an adequate substitute for manure and needs no carting, because it is produced on the fields.

The idea—an old one—was to grow a nitrogen-collecting crop, which would then be plowed in green, thus providing nitrogen for the cotton crop that follows it. The problem was, however, to find a place for the nitrogen crops without curtailing either the cotton or grain areas. No provision was made for this in the old cotton-crop rotations, but the problem became easier when grain and beet were introduced into the rotation. As these crops were gathered long before cotton, namely, in September, winter peas could be sown. They produce considerable growth by April of the following year. Plowed under, this growth would provide about 100 kilograms of nitrogen per hectare (89 pounds per acre) for the succeeding cotton crop. This makes it possible to take advantage of the autumn and early spring sunshine of Central Asia, and of the unoccupied winter areas, to make good the wartime shortage of nitrogen fertilizer.

The difficulty was, however, that adequate supplies of winter-pea seed were not available in the Soviet Union. A suggestion that they be ordered from the United States was carried out, and the order was placed through the Commissariat of Foreign Trade. Four thousand tons of the seed arrived, which were sown for multiplication. (This method of planting a winter crop for green manure could be expediently adopted also in Transcaucasia, in the cultivation of tea, citrus plants, and corn.)

In the summer of 1943 all the evacuated institutions returned to Moscow. Teaching and research were resumed in the Timiryazev Academy.

Now that the victorious advance of the Red Army had liberated a vast area of German-occupied territory, an immense task faced Soviet agricultural scientists—that of helping to rehabilitate agriculture in the regions that had been devastated by the invader. Livestock had been practically annihilated, and this meant that there was no manure for the fields.

Even when products of the nitrogen industry again become available for agriculture, they will go mainly to the industrial crops (cotton, tea, sugar beet, flax, tobacco, hemp). The vast area sown to grains, amounting to about 110,000,000 hectares (272,000,000 acres) out of the total crop area of 150,000,000 hectares (371,000,000 acres), must have a cheaper source of nitrogen.

Once again consideration is given to green manure, which formerly was only considered of value for sandy soils, but which will now acquire universal significance. In selecting the most suitable nitrogen-collecting plant for this purpose, the problem of seed will again arise, since enormous quantities will be required for the devastated regions of the Ukraine, Belorussia, and the RSFSR.

Formerly the annual lupine (*Lupinus angustifolius*) was cultivated in the Soviet Union as green manure for sandy soils. But it requires a large amount of seed (180–200 kilograms per hectare or 161–178 pounds per acre): so my recommendation is that the perennial lupine be introduced instead for this purpose, since its seed is much smaller. It matures as far north as Archangel, and its ratio of multiplication is high—100:1. By planting 4 kilograms per hectare (3.6 pounds per acre) in wide rows, 4 quintals can be obtained, at a modest estimate. From 4 quintals (882 pounds) of seed gathered from one hectare (2.5 acres) in July 1944 (actually twice that amount may be gathered) and planted out in a suitable latitude, we can obtain 400 quintals (882,000 pounds) in 1945, 40,000 (8,820,000) in 1946, 4,000,000 (882,000,000) in 1947, etc.

In a word, this lupine can be multiplied far more rapidly than the cattle herd can be restored and the previous amount of manure obtained from it. Its seed should be imported from Canada (native habitat), where an order has already been placed. It can

be sown in July and August, and all the small plots of this lupine to be found in our experiment stations should be left for seed (not plowed in). All available stocks should be utilized for intensive multiplication under conditions that will permit a hundredfold increase of the seed annually.

This will be a valuable measure in the central and northern zones of the Non-Black-Soil Belt. As to the more southern zone (for example, Kiev region, Southern Belorussia, the Black Sea region, and territories east of it), these areas have a larger choice of plants, because they can utilize such a valuable but warmth-loving nitrogen collector as serradella, which, unlike clover, when planted in the spring produces a green mass suitable for fodder in the summer of the same year, whereas the stubble can be used as green manure. Also, serradella can be grown on subsandy soils which are too poor for clover. The seed can probably be found in Poland and East Prussia; it should also be ordered from America.

The common (large-seed) annual lupine should also be intensively multiplied wherever the seed ripens well (south of Moscow).

The enumerated nitrogen-collecting plants should be cultivated as a general measure on all soils until livestock breeding is restored to normal and adequate quantities of manure are available. After that, green manure will again be confined principally to sandy soils. The perennial lupine—that native of North America—is, however, due to become a valuable cultivated plant of our north, because it is an effective improver of Podsol soils cleared of forests for agricultural purposes.

The growth of lupine for 3 years renders the soil highly fertile and capable of yielding good crops of wheat, rye, flax, and potatoes. In Siberia and the Far Eastern Maritime Region, particularly, where, owing to the fact that the cultivated tracts are scattered through forests and in hilly country the cartage of manure to the fields is a problem, this lupine is destined to play a big role both in maintaining the fertility of old land and in bringing under cultivation tracts newly cleared of forest. Not exacting as regards warmth and requiring small quantities of seed, lupine should be an important factor in the development of agriculture in Siberia and in other regions rich in water power and mineral resources.

Now that the war has ended victoriously, Russian agricultural scientists are faced with the urgent task of helping to raise crop yields. This is necessary both in the liberated regions, where the dearth of cattle is almost absolute, and in other parts of the Soviet Union, where the wartime reduction in the manufacture of chemical fertilizer has affected the yields of industrial crops. In this we must draw largely upon the experience of the world generally, but of the United States in particular, for the two countries have many problems in common, including the cultivation of cotton and citrus fruits in the south, of corn and wheat in the central zones, and of rye, potatoes, and flax in the north. Regular exchange of agricultural information and experience, and even of crop varieties, may therefore prove a valuable supplement to the general cultural and political relations between the two countries.

The Cattle Industry of Colombia

by **OSCAR MOORE***

Cattle are produced in Colombia primarily for domestic consumption. Soaring wartime prices have given impetus to an expansion in numbers and plans for improvement of the industry. A small export trade also developed during the war years. Future prospects depend largely upon price levels, better transportation facilities, and improvement of stock and pastures.

In Colombia cattle raising is a major industry. The number of animals, as estimated by the Government in 1942 (table 1), totaled nearly 11 million head, but no official census has been taken. The Government figure was based principally on taxes collected on cattle slaughtered in public slaughterhouses plus some allowance for unreported slaughter.

Cattle slaughtered during 1942 were estimated at nearly 1,100,000 head, or about 10 percent of the total number of cattle. Yearly totals fluctuated but little from 1938 through 1941. Since 1941, some increase in the number of cattle slaughtered has occurred; 14 percent in 1943, compared with 1941 figures, and an additional increase of 5 percent during the first 6 months of 1944 (table 2).

Of the several different kinds of livestock raised in Colombia, cattle are most important, followed by hogs, a poor second totaling about 1,600,000 head in 1938. Cattle are raised in sufficient numbers to pro-

*Office of Foreign Agricultural Relations.
Based largely on HOPKINS, JOHN A. ANNUAL LIVESTOCK REPORT—COLOMBIA. U. S. Cons. Rpt. 294, 31 pp., illus. Bogotá. 1945. [Hectographed.]

vide most of the domestic requirements for beef and dairy products. At times some have been exported, as to the Canal Zone during World War II. Although cattle numbers for some years have been increasing, the Colombian population likewise has been increasing at a slower rate.

Cattle are raised for the most part by small producers, usually in numbers under 100. Production methods are generally rather primitive. The calf crop of the beef herds is thought to be small, although the total is not definitely known. Calf mortality is high, the number raised to 1 year of age being perhaps about 60 percent of the cow herd.

TABLE 1.—*Estimated numbers of cattle in Colombia and distribution of production and slaughter, by Departments, 1942*

Area	Number as of Dec. 1942 (1)	1942 Slaughter (2)	Received from other areas (3)	Sent to other areas (4)	Unreported slaughter (5)	Net production [1] (6)	Balance [2] (7)
	Thousands	*Head*	*Head*	*Head*	*Head*	*Head*	*Head*
Antioquia	1,165	144,315	59,473	.....	1,443	86,285	+32,779
Atlántico	234	48,102	19,000	.....	481	29,583	−5,632
Bolívar	2,076	68,563	6,000	[3] 132,525	2,056	197,144	+15,063
Boyacá & Casanare	1,086	51,641	.....	55,125	2,066	108,862	+2,164
Caldas	663	116,015	43,320	.....	1,160	73,855	−6,125
Cauca	481	32,283	.....	.....	322	32,610	+16,506
Cundinamarca	776	161,068	50,042	.....	1,610	112,636	−33,320
Huila	373	41,950	.....	14,960	419	57,329	−19,170
Magdalena	954	37,643	.....	45,157	3,764	86,564	+10,969
Nariño	337	18,602	.....	2,100	186	20,888	+13,550
Santander Norte	255	47,210	[4] 30,189	.....	472	17,493	+8,578
Santander Sur	318	92,141	45,601	.....	921	47,461	−14,984
Tolima	925	92,239	10,049	.....	922	83,112	+11,403
Valle	795	101,155	10,850	.....	1,011	91,316	−10,123
Chocó & San Andrés	12	2,413	568	.....	241	2,086	−854
Guajira	156	780	.....	[5] 17,046	78	17,904	−1,976
Eastern Territories [6]	328	16,039	2,478	16,497	1,602	31,660	+1,875
Total	10,934	1,072,159	264,381	281,410	[7] 18,754	1,096,788	+20,703

[1] Column 2 plus 4 plus 5, minus column 3.
[2] Surplus production (over consumption)=+balance; deficit (less than consumption)=−balance.
[3] Includes 17,706 exported to Panama.
[4] Includes 15,189 imported from Venezuela.
[5] Includes 2,000 exported to Venezuela.
[6] Includes Meta, Arauca, Caquetá, Putumayo, Vaupes, Vichada, Amazonas.
[7] Illicit or unreported slaughter estimated at 3 percent of the reported slaughter in Bolívar, 4 in Boyacá, 10 in Magdalena, 10 in Chocó, San Andrés, and Eastern Territories, and 1 percent elsewhere.

Source: HOPKINS, JOHN A. ANNUAL LIVESTOCK REPORT—COLOMBIA. U. S. Cons. Rpt. 294, 31 pp., illus. Bogotá. 1945. [Hectographed.]

Cattle may be fattened for market by the producers, particularly by large cattlemen located in the areas having the better pastures, but generally they pass through several hands. There is considerable specialization in cattle breeding, raising, or in fattening. Breeding and raising are practiced in areas of both poor and good pasturage, but fattening is dependent upon good pasturage. Cattle raised in the Department of Bolívar, for example, may be driven in a thin condition to fattening pastures in the Cauca River Valley in the vicinity of Medellín, to the plains of Tolima, or to the fattening pastures south of Bucaramanga in Santander, where they remain from 6 months to over a year. They are slaughtered thereafter in nearby towns and cities.

TABLE 2.—*Reported slaughter of cattle in Colombia, 1938–44*

Area	1938	1939	1940	1941	1942	1943	1944 [1] Jan.–June
	1,000 head	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*
Antioquia	139	140	137	141	144	158	85
Atlántico	39	36	41	42	48	47	22
Bolívar	65	59	58	59	69	72	45
Boyacá	43	49	44	45	52	53	26
Caldas	110	110	112	100	116	129	70
Cauca	30	32	30	31	32	34	18
Cundinamarca	144	139	146	149	161	172	86
Huila	36	37	39	40	42	42	22
Magdalena	38	32	33	34	38	36	16
Nariño	19	19	16	20	19	18	9
Santander Norte	47	51	45	44	47	48	23
Santander Sur	90	87	87	86	92	95	49
Tolima	88	86	88	90	92	94	52
Valle del Cauca	91	96	92	92	101	117	65
Intendencias and Comisarias	15	15	17	18	19	12	7
Total	994	988	985	991	1,072	1,127	595

[1] Preliminary.

Source: HOPKINS, JOHN A. ANNUAL LIVESTOCK REPORT—COLOMBIA. U. S. Cons. Rpt. 294, 31 pp., illus. Bogotá. 1945. [Hectographed.]

Cattle raising is carried on to some extent in all climatic areas, but cooler atmospheric temperature, more adequate water supply throughout the year, and relative freedom from cattle fever tick make the temperate regions most favorable for the production of both cattle and milk. The high mountain valleys and plateaus of the Departments of Cundinamarca, Boyacá, and Santander are the principal centers of dairying and cattle raising under temperate conditions. (See fig. 1.) Dairying is a specialization of the Bogotá *Sabana* (grassy plain). Both cattle raising and dairying are found under tropical conditions along the Caribbean coast in the Department of Bolívar, the latter industry being centered around the cities of Barranquilla and Cartagena. The Cauca River Valley, especially in the Department of Valle, is an important livestock section. Extensive grazing is also provided for livestock in the subtropical, mountainous areas of the Departments of Antioquia, Caldas, Cauca, and Tolima.

Regional Production Patterns

Colombia is divided, according to elevation, into four agricultural regions: (1) A temperate region, varying in elevation from 7,500 to 10,000 feet, and covering the Bogotá Sabana and parts of the Departments of Boyacá and Santander; (2) an intermediate region, from 5,000 to 7,500 feet in elevation, represented by the valleys in the Departments of Caldas and Antioquia; (3) a subtropical region, from 3,000 to 5,000 feet above sea level, represented by the valley of the Cauca River; and (4) a tropical region, varying from sea level to about 3,000 feet, including

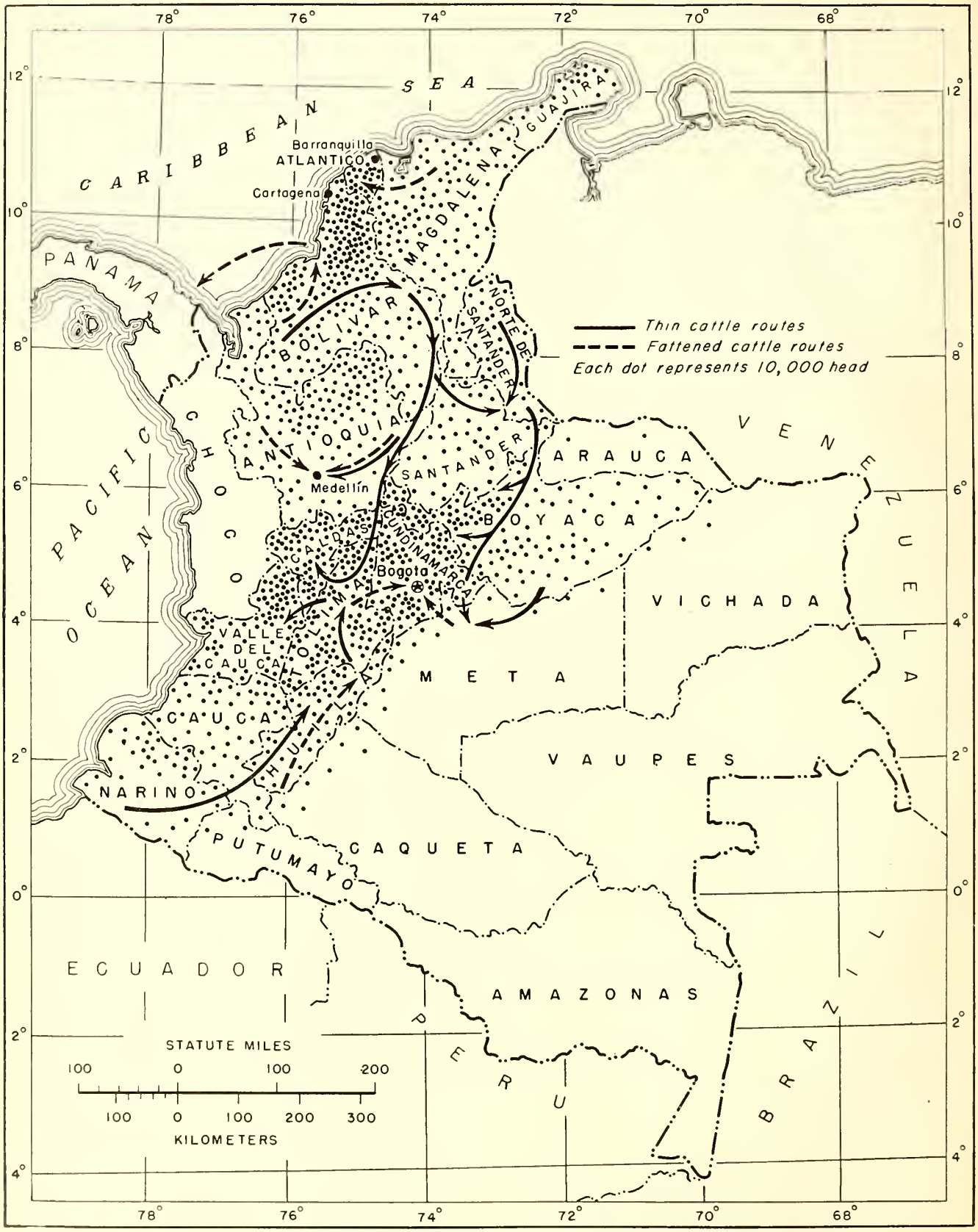

FIGURE 1.—Distribution of cattle in Colombia, 1942, and principal routes of thin cattle to fattening regions and of fat cattle to market.

the coastal areas of the Departments of Bolívar, Atlántico, and Magdalena.

The Sabana region is one of the chief agricultural centers in Colombia, but drought is a limiting factor that could be overcome by the installation of irrigation facilities. Many improved herds of cattle are located in this region. The intermediate region is mountainous with numerous small fertile valleys, where many cattle are raised. Droughts are infrequent. The subtropical region, of which the Cauca River Valley is typical, is potentially an important agricultural region. Actually, however, it is devoted to pastoral grazing of native cattle. Improved cattle are needed. Although droughts occur regularly with devastating effect, much of the valley could be irrigated. In the tropical region, cattle are raised primarily for beef. The valleys of most of these regions are subject to floods during the wet season, as well as to drought for one or two months of the dry season. Thus, both irrigation and drainage problems need to be solved.

Cattle-raising methods vary somewhat from region to region in Colombia, but, generally speaking, Colombian beef is produced and fattened on grass, with no grain feeding. Native grasses supply most of the pasturage, but in the regions where cattle raising is more specialized several improved grasses are used. Among these, Pará grass, which is particularly valuable for fattening, and guinea grass are the most common. They have a higher carrying capacity than the native grasses.

Colombian pasture grasses are mostly carbonaceous and not nitrogenous, though in some regions there is a small percentage of native legumes scattered through the grasses. Little alfalfa is grown. One animal requires only 1 acre of planted pasture but from 4 to 7 acres of natural pasture. Weights of 900 to 1,000 pounds, yielding from 450 to 550 pounds of beef, are attained at from 4 to 5 years of age.

Colombian Cattle Breeds

In the tropical regions, numerous attempts have been made to cross European breeds with the native cattle, but little has been gained thereby, from a beef-production standpoint. The Zebu, however, when crossed with native cattle in the Colombian tropics, has tended to improve beef production, since the resulting progeny shows resistance to heat and parasitic infestation.

In the Caribbean-coast region there is a fairly definite type of cattle called the Costeño con Cuernos (coastal cattle with horns). This is known likewise as Andaluz. These animals are large-boned, with a reddish-tan, black, or brindle color. They grow rather slowly. When fattened, however, they are a fairly good beef type. With the exception of the Romo-Sinuano, the Costeño con Cuernos is possibly the best native breed for beef.

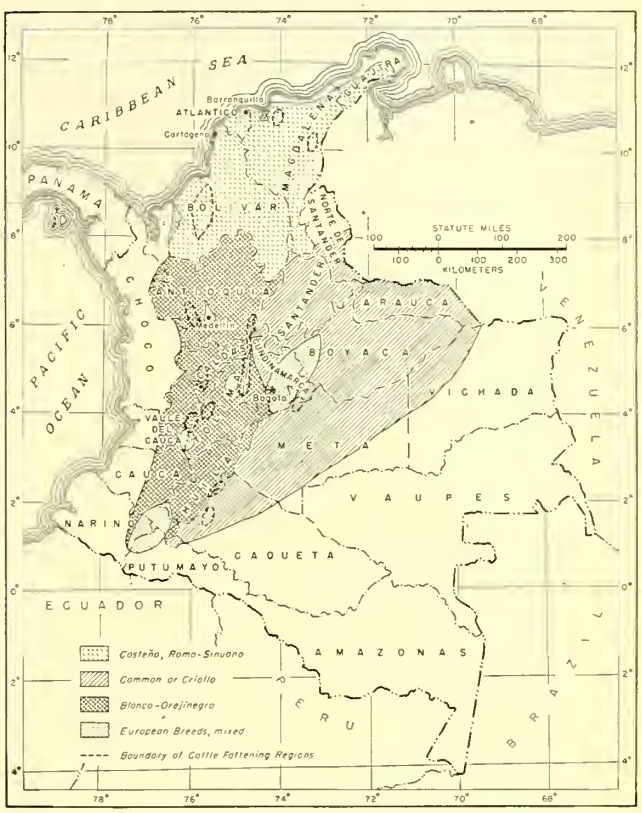

FIGURE 2.—Distribution of principal breeds of cattle and principal centers of cattle fattening in Colombia.

Like the Costeño, the Romo-Sinuano breed is found in the Caribbean-coast region, particularly in the valley of the Sinú River (fig. 2). This breed is reddish to reddish brown in color, polled, and somewhat blocky in conformation. The belief is that it originated 50 or 60 years ago as a result of crossing Aberdeen Angus, Red Polled, or both, with the Costeño con Cuernos. There are probably 100,000 head of the Romo-Sinuano breed in the coastal region as compared with 2 or 3 million head of the Costeño breed. Blanco-Orejinegro cattle are of a dual-purpose type, small in size, with black skin and white hair. They are considered to be better adapted to grazing on the steep mountainsides of the Central Cordillera than the heavier breeds and are, therefore, located chiefly in the Andes.

Cattle in the sabanas near Bogotá are largely of dairy or dual-purpose type. Holstein strains are perhaps most common. They are likewise found in the Cauca Valley and in other sections where milk

FIGURE 3.—Costeño con Cuerno cattle at Medellín market, Colombia.

production is important, particularly in the upland and medium-high regions. Normandy cattle are also raised in the Bogotá Sabana region. This breed resembles the Holstein, but Normandy cattle are red and white, instead of black and white, and are of a more beefy type. In the Cauca Valley, various breed mixtures are produced. Criollo cattle are perhaps most common. Some Red Polled blood is observed, and Blanco-Orejinegros are raised there. In the eastern llanos, mixed breeds prevail, with Spanish blood predominating. Cattle with European strains are mostly raised in the dairying regions, which, in turn, are located near, or in the milksheds of, the large cities.

Insects and Diseases

Ticks and Texas fever are common in Colombia. They take a particularly heavy toll in the tropical regions. Although at the lower elevations cattle should be dipped every 2 or 3 weeks, they are generally dipped only once or twice during the dry season and not at all during the wet season.

At elevations of from 1,500 to 5,000 feet, the "nuche" (*Dermatobia hominis*) is prevalent. This is a warble fly, the larvae of which live under the hide of cattle. No effective means for the control of this pest have been developed.

Among the common cattle diseases prevalent in Colombia are symptomatic carbuncle, pseudoaphtous stomatitis, three types of Texas fever, blackleg, trypanosomiasis, and black diarrhea. Only a few cases of tuberculosis, paratuberculosis, mastitis streptococci, actinomycosis or lumpy jaw, and anthrax have been reported, but failure in diagnosis may conceal their prevalence. Foot-and-mouth disease and rinderpest are thought not to be present in the country.

Transportation

Lack of adequate transportation facilities causes the loss of much beef in Colombia. Considerable shrinkage in live weight occurs while the animals are on the way to market. Cattle raised in the eastern llanos are generally slaughtered in Bogotá. To reach this city about 35,000 head of cattle per year are driven from the fattening ranges in the vicinity of Villavicencio, at an elevation of approximately 1,500 feet, across a mountain range, approximately 10,000 feet high, and thence down to an altitude of 8,500 feet, the location of Bogotá. This drive requires 6 days, during which time little feed is available. The animals lose about 100 pounds in weight per head, and the quality of their meat suffers seriously. Many other routes to markets are equally arduous (fig. 1).

Cattle produced on the Bolívar-Magdalena ranges must be driven long distances to market, but pasture is available along some of the trails over which these animals pass. They may be driven to the Magdalena River and thence transported part of the distance to market aboard river steamers; or, as an alternative, the cattle may be driven overland to Medellín, to the Cauca Valley, or to the grazing ranges in Santander or Tolima. Regardless of the route traveled, loss of weight is great, necessitating additional grazing for from 6 to 10 months near the markets of Medellín, Bucaramanga, or on the Tolima or Cauca Valley ranges.

TABLE 3.—*Imports of cattle into Colombia, by countries of origin, 1940–43*

Year	Country of origin	Imports		Value	
		Head	Net weight	Colombian currency	United States currency
		Number	*1,000 pounds*	*Pesos*	*Dollars*
1940	Brazil	179	99	6,332	3,616
	United States	31	28	25,775	14,717
	Venezuela	15,773	6,953	543,624	310,409
	Others	3	3	3,462	1,977
	Total	15,986	7,083	579,193	330,719
1941	Brazil	130	57	4,338	2,477
	United States	665	574	281,157	160,541
	Venezuela	16,915	8,198	603,937	344,848
	Others	16	21	3,872	2,211
	Total	17,726	8,850	893,304	510,077
1942	Brazil	13	5	438	250
	United States	228	120	21,849	12,476
	Venezuela	15,416	10,196	680,689	388,673
	Others	1	1	632	361
	Total	15,658	10,322	703,608	401,760
1943	United States	221	146	13,099	7,506
	Venezuela	9,022	6,172	505,897	289,879
	Others	11	11	7,252	4,155
	Total	9,254	6,329	526,248	301,540

Source: HOPKINS, JOHN A. ANNUAL LIVESTOCK REPORT—COLOMBIA. U. S. Cons. Rpt. 294, 31 pp., illus. Bogotá. 1945. [Hectographed.]

The overland drive from the Sinú Valley to Medellín requires about 45 days, which allows some time for pasturing on the way. Cattle are believed to lose about 175 pounds per head on this trip. Such losses, however, are estimates, for there are few cattle scales in Colombia. Because of this, cattle are generally bought and sold by the head. Probably all cattle transported from the Bolívar-Magdalena region inland, either by boat or overland, lose from 165 to 175 pounds per head.

Estimates indicate that an average of 138,000 head of cattle are moved inland from the four Departments of the Caribbean coast each year. An estimated annual average of 146,000 head are slaughtered in these Departments, and they likewise suffer considerable loss in transit to slaughterhouses but less than do those driven out of the region.

Thus, inadequate and costly transportation is perhaps the most serious problem confronting the cattle industry of Colombia. Much beef is lost outright by deaths, and the quality of the remaining meat is lowered on the way to market. Loss in weight from range to market means that some 12 percent of the beef produced in the llanos region, and perhaps 18 or 20 percent of that produced in Bolívar, never reach market. Furthermore, the cost of driving the cattle is high.

TABLE 4.—*Exports of cattle from Colombia, by countries of destination, 1940–44*

Year	Country of destination	Exports		Value	
		Head	Net weight	Colombian currency	United States currency
		Number	*1,000 pounds*	*Pesos*	*Dollars*
1940	Curaçao	18	7	370	211
	Panama	857	416	31,440	17,952
	Venezuela	139	27	5,362	3,062
	Total	1,014	450	37,172	21,225
1941	Curaçao	4	1	60	34
	Panama	1,400	1,420	100,800	57,456
	Canal Zone	1,080	1,095	77,760	44,323
	Venezuela	336	96	21,665	12,349
	Total	2,820	2,612	200,285	114,162
1942	Curaçao	69	31	4,000	2,284
	Ecuador	2	1	200	114
	Panama	929	984	73,667	42,064
	Canal Zone	16,142	17,166	1,246,426	711,709
	Total	17,142	18,182	1,324,293	756,171
1943	Curaçao	178	69	8,900	5,100
	Ecuador	92	62	6,000	3,438
	Canal Zone	21,547	23,874	2,305,568	1,321,090
	Total	21,817	24,005	2,320,468	1,329,628
1944 (Jan.–Sept.)	Curaçao	929	----------	83,470	47,828
	Canal Zone	16,748	----------	1,977,653	1,133,195
	Peru	399	----------	46,706	23,325
	Venezuela	15	----------	9,700	5,558
	Total	18,091	----------	2,111,529	1,209,906

Source: HOPKINS, JOHN A. ANNUAL LIVESTOCK REPORT—COLOMBIA. U. S. Cons. Rpt. 294, 31 pp., illus. Bogotá. 1945. [Hectographed.]

FIGURE 4.—Blanco-Orejinegro cattle on the road between Canas Gordas and Antioquia, Colombia.

Marketing

By far the greater proportion of the beef cattle produced in Colombia are marketed domestically to provide meat for home consumption (table 2). Medellín, Barranquilla, and Bogotá are the principal marketing centers. Since 1941, prices have shown marked advances; apparently not from a shortage of supply, since the number of cattle slaughtered has increased more rapidly than the gain in population, but rather from greater consumer demand, attributed to increased wartime purchasing power. In the Medellín Public Market, for example, which handles the bulk of the cattle sold in that city, average cattle prices nearly doubled from 1941 to early 1945.

Cattle account for a relatively insignificant percentage of Colombia's foreign trade. Imports into the country originate principally in Venezuela and come through Cúcuta. More than 15,000 head were imported annually during 1940–42. In 1943, however, imports dropped to about 9,000 head (table 3).

Since the beginning of World War II, Colombia has exported a small number of cattle. Most of these have come from the Department of Bolívar and have gone to Panama, the Canal Zone, and Curaçao, with small shipments reported to Venezuela and Peru (table 4). Producers in the Caribbean region of Colombia are reported to be interested in developing and expanding foreign outlets for their cattle in order to raise local prices and to avoid the long and costly drive to interior consumption centers.

Government Aid

The Colombian Government renders assistance to the cattle industry through the Livestock Department of the Ministry of National Economy. One section directs various campaigns to control or erad-

icate animal diseases. It exercises control over the inspection and sale of serums and tries to reduce tick infestation by encouraging the construction of dipping vats. This agency also makes pathological investigations and analyzes biological materials, such as serums, dips, etc.

Another section of the Department operates six livestock experiment stations in various localities. Four are concerned with cattle breeding and two with horse and sheep breeding. Various smaller stations are maintained to aid livestock producers, and 12 new stations either are under construction or have been planned for future construction.

Both the Government and private breeders have expended considerable effort to improve the quality of Colombian cattle. Numbers of dairy, dual-purpose, and beef breeds have been imported from the United States and Europe. In 1941, imports of purebred cattle totaled about 1,050 head. Imports of dairy cattle included Holstein-Friesians, Ayrshires, Jerseys, Brown Swiss, and Guernseys. Dual-purpose cattle brought in included the Normandy, Red Polled, and Milking Shorthorn breeds. Beef cattle of the Brahma, Shorthorn, Aberdeen Angus, and Hereford breeds have been imported in attempts to improve the quality of the Criollo as a meat animal. A greater degree of success has apparently been attained with dairy herds than beef herds.

Zebu sires, which have characteristics suitable for Colombian conditions, were first imported into the country in 1905. About 1931, however, the Government prohibited further importations, since it believed that the Zebu blood was too dominating for that of the native strains. The general opinion was that native blood should not be eliminated, but no one knew what proportion of Zebu blood should be maintained. In 1939, the restriction was withdrawn, but only the Government could import Zebu cattle. It sold sires to ranchers who could be entrusted to maintain a proper proportion of native blood in their cattle, but both full-blooded and mixed Zebu cattle are available to all buyers from breeders in Colombia.

The Romo-Sinnano is being improved at the National Livestock Experiment Station at Montería in an effort to develop a true-reproducing type of quality cattle suitable for tropical conditions. Experimental crosses are also being made by using the Romo-Sinuano and the Zebu or Brahma in an effort to develop a larger and faster growing animal. These crosses with Zebu are regarded with great favor, particularly when the proportion of Zebu blood ranges between 25 and 50 percent.

United Kingdom Production and Marketing Policy for Hogs

by **DAVID D. JONES***

Government assistance to the hog industry of the United Kingdom had been available for some years but had achieved only indifferent success by the outbreak of World War II. Nonpreferential treatment during the war years, in contrast to that given other types of livestock, caused the industry's position to deteriorate rapidly. Future prospects, despite some recovery during the past year, are uncertain owing to the Government's omission of hogs from recent price-guaranty legislation.

During World War II the United Kingdom hog population was lowered to less than half the prewar total, which, largely through Government policies protecting it from foreign competition, had been brought to the point of supplying about half the British pork consumption. With the war, imports of feed concentrates were restricted, and other types of livestock were favored in the allocation of feed supplies; hog numbers had, therefore, to be reduced. At the same time, most normal sources of pork imports were cut off; thus, Canada and the United States, with enormously increased supplies, stepped into the breach.

Within the past year, British hog numbers have recovered to just above half the prewar level, and additional increases are expected. This is true, even though feedstuffs and the needed skilled labor may continue short for some time and the Government has not included hogs in its 4-year price guaranty for certain other agricultural products.

For some time the United States may continue to supply abnormal quantities of pork products to the

*Office of Foreign Agricultural Relations.
This article is one of a series dealing with United Kingdom Government policy as related to the production and marketing of certain types of livestock and livestock products. For earlier statements, see FOREIGN AGRICULTURE 9: 105–108 and 8: 282–284.

United Kingdom market; but there will again be a tendency, as soon as conditions permit, to rely on imports from countries that produce the leaner types and lighter cure preferred by British consumers. The eventual level of imports will depend largely on the level to which domestic hog production returns; this, in turn, will depend partly on reduced production costs, but a major factor probably will again be the nature and extent of Government controls and of Government assistance against competition from imported pork products.

Prewar Controls

The first direct governmental assistance to the then declining British hog industry was forthcoming early in the 1930's. The Government had developed a plan for reducing meat imports, which was incorporated in the Ottawa Agreements Act, 1932. Import quotas were established on the basis of restriction to a percentage of imports from July 1, 1931, to June 30, 1932, a period designated as the "Ottawa Year." Hogs and pork products were, however, not included in the arrangement. Instead, agreements were reached with the principal exporting countries to reduce their bacon and ham shipments to the United Kingdom by 20 percent of their exports during November–August 1932–33. This was followed by further reductions of 11 percent in September and 16 percent in November 1933.

In 1933, also, a Pigs Marketing Scheme Order created a Pigs Marketing Board to control the sale of pigs either to registered curers or to the Board itself. At the same time, a Bacon Marketing Scheme Order created a Bacon Marketing Board.

After consultation with the Bacon Marketing Board, the Pigs Marketing Board prescribed the terms on which contracts for the sale of pigs were to be made by registered producers, together with the selling prices and delivery dates involved. All contracts had to be registered with and approved by the Board.

The quality of United Kingdom bacon suffered from the emphasis placed on dual-purpose hogs and indiscriminate selling of various types of hog meat for pork or bacon. On the average, the amount of equipment and number of hogs on United Kingdom hog farms were not sufficient to permit operation at maximum efficiency. An even or level supply rate of hogs to the bacon-curing factories was also lacking.

The Pig and Bacon Schemes were intended to assure producers and curers of returns sufficient not only to cover costs but also to make the industry efficient enough to compete successfully against all imported bacon by means of modernized breeding, feeding, and marketing methods. With increased prices and restricted imports, the hope was that the domestic product might eventually replace all foreign bacon. Sales of pigs otherwise than to a curer or to the Board and sales to a curer of pigs not intended for bacon production were exempt from the Pigs Marketing Scheme. Unregistered or registration-exempt producers were not permitted to sell any pigs.

The contract system proved unsuccessful in keeping the curers adequately supplied with animals because of consumer preference for imported bacon, which, in turn, resulted in prices continuing higher for pork than for bacon pigs. Consequently, the recommendations of a Reorganization Commission were followed, and a Bacon Development Scheme was instituted in September 1935. A Bacon Development Board, composed of representatives of the Pigs and Bacon Boards, together with nominees of the Minister of Agriculture, was established. Its main purpose was to license bacon factories. After January 1, 1936, the production of bacon was not permitted anywhere in the United Kingdom unless a producer was either exempt from registration under the Bacon Development Scheme or was licensed by the Bacon Development Board. By such a system, the Board was better able to control bacon production and to obtain a more even distribution of hogs to the bacon factories.

Early in 1936 an attempt was also made to discover the causes of the bacon industry's difficulties in order that changes deemed necessary from experience could be made in the above-mentioned schemes. A Joint Advisory Committee was established, comprising representatives of the Pigs Marketing and Bacon Development Boards and a Minister of Agriculture appointee, who was the chairman. This Committee's investigation resulted in Parliament's passage of the Bacon Industry Act of July 1938, which included provision for a 3-year subsidy.

That Act guaranteed to farmers, through curers, a fixed price of 12s. 6d. per score—20 pounds—(15 U. S. cents per pound), dead weight, when costs of hog-feeding rations averaged 8s. 6d. ($2.08) per hundredweight (112 pounds). Such fixed price was composed of the prevailing competitive market price plus a subsidy sufficient to assure the producer of a reasonable profit. If feeding costs rose above 8s. 6d., curers paid farmers proportionately more, and the Exchequer reimbursed the curers for the additional expenditure. If feeding costs fell below 8s. 6d., curers paid farmers proportionately less, paying the difference to the Exchequer. Price fluctuation from the mean was at the rate of 10d. per score (1

cent per pound), dead weight, added to or subtracted from the producer's price for every 1s. (24 cents) by which feeding-ration costs rose above or fell below 8s. 6d. per hundredweight.

A new Bacon Development Board was created by the Act, composed of appointees chosen by the Minister of Agriculture, in conjunction with the Secretary of State for Scotland, and of nominees of the Pigs and Bacon Marketing Boards. With the Development Board in charge of all policy matters, the two Marketing Boards executed the orders of the former with respect to such matters as the determination of quantities and descriptions of bacon that might be produced domestically. The Act also continued arrangements which had previously been made for the regulation of supplies of imported bacon.

On December 15, 1938, the Bacon Industry Act was amended, retroactive to October 1. The changes affected the prices fixed for bacon by raising them slightly; also, they modified the methods of identifying imported hogs and weighing bacon relative to proving claims in connection with the above-mentioned payments by the Exchequer to curers or vice versa.

The amount of bacon cured domestically in 1935 increased by 37 percent over 1934 and by an additional 16 percent in 1936. During the 1934–38 period, prices per score, dead weight, for fat hogs averaged 13s. 1d. (16 cents per pound). Since the inauguration of marketing controls in 1932, pork prices have risen somewhat, British pork bringing slightly more than, for example, imported New Zealand pork. A greater rise has occurred in bacon prices, those of imported Danish bacon increasing proportionately more than those of British bacon (table 1).

Wartime Control

With the coming of war, the Bacon Marketing Scheme was indefinitely suspended, and the Pigs Marketing Scheme changed character when, early in 1940, the Ministry of Food assumed control over all domestically killed meat. That agency has since bought all livestock offered for sale, at fixed prices, with farmers having to give 12 days' notice to the appropriate collecting center of the number and type of animals they desired to sell.

Private slaughter of hogs was prohibited in January 1940. Animals going to the above-mentioned collecting centers are there graded on the hoof for type by a panel of three composed of a farmer, a butcher, and an auctioneer. The hogs are then consigned to centrally located area slaughterhouses, where the carcass weights are determined. Hog prices are specified in advance and are based upon type and dead weight, varying in accordance with seasonal conditions. The early days of the war saw a reduction in value of certain types in order to effect a fall in numbers dictated by the scarcity of feed.

TABLE 1.—*Wholesale pork and bacon prices in England and Wales, selected years, 1932–38*

Product	1932	1934	1936	1938
	Cents per lb.	*Cents per lb.*	*Cents per lb.*	*Cents per lb.*
Home-produced pork	11	19	18	19
New Zealand pork	9	14	13	15
Home-produced bacon, Green Wiltshire	14	22	21	23
Danish bacon, Green Sides	10	21	22	23

AGRICULTURAL ECONOMICS RESEARCH INSTITUTE. AGRICULTURAL REGISTER, 1938–39. 352 pp., illus. Oxford. 1939. See p. 340.

Until February 1941, concentrated-feed supplies were allocated by the Government to merchants and by the latter to their customers on the basis of prewar purchases. After that time, as a result of experience with uneven distribution, and because of increasing shortages, a rationing scheme for concentrated types of feed was instituted based upon a livestock priority scale. In practice, hogs have benefited little from this system by reason of their having been given the lowest priority rating. Home production of bulky feed items has, however, greatly increased, and these have remained unrationed. Farmers are also allowed to keep any home-grown feed grain, although the amount retained is taken into account when an individual's ration allowance is determined by the feedingstuffs officers of the respective County War Agricultural Executive Committees. Farmers are required to register with not more than three supply merchants and to deposit their coupons within a few days after receipt with the merchants selected, thus enabling the latter to order the supplies required.

In order to secure equitable treatment, rations for hogs were related to the numbers that were kept on a given holding before the war. The allowances were gradually reduced, and, after September 1942, they were made at the rate of full rations for one-eighth of prewar numbers. Also, since a producer might use certain home-grown crops for feed, the rations allowed were further reduced by an amount representing one hog per 8 acres of the agricultural land occupied.

By utilizing household, garden, and farm waste, farmers have usually managed to keep a much larger proportion of their prewar total than indicated by the number of hogs for which they have received rations. Supplementary rations have been granted

to efficient breeders in the interest of preserving a nucleus of sound breeding stock for postwar herd expansion.

Trends in Hog Numbers

The aggregate effect of a critical lack of imported corn for fattening, the lowest feed-ration priority, and a shortage of skilled agricultural labor is evidenced by the 58-percent decline in the United Kingdom hog population from an annual average of 4,466,000 during 1936–38 to 1,875,000 in 1944.

A rapid expansion of the country's hog numbers occurred in the years 1930 through 1935, which roughly corresponded to the inaugural period of governmental control and assistance to the home industry. From the latter year until the beginning of the war, hog numbers became rather well stabilized (table 2).

Culminating the sharp drop in hog numbers, following the outbreak of war, was the low point of 1,829,000 head reached in June 1943, which is the smallest number on record. As such, it represented approximately 50 percent of the 1931–35 average of 3,739,000 head and about 43 percent of the 1936-40 average of 4,380,000 head.

By June 1944, there was an upward swing, with an increase in sows for breeding particularly noticeable. Approximately a 25-percent increase in hog numbers was in prospect by June 1945. Further expansion is likely by next year as a result of the Government's announcement, on April 21, 1945, that feed rations would be liberalized, beginning in June.

Table 2.—*Number of hogs in the United Kingdom, June 1, 1930–44*

Year	Sows	All other pigs	Total
	Thousands	*Thousands*	*Thousands*
1930	354	2,316	2,670
1931	445	2,736	3,181
1932	465	3,105	3,570
1933	454	3,053	3,507
1934	519	3,388	3,907
1935	574	3,958	4,532
1936	569	3,993	4,562
1937	541	3,912	4,453
1938	521	3,862	4,383
1939	542	3,852	4,394
1940	468	3,638	4,106
1941	244	2,312	2,556
1942	250	1,894	2,144
1943	186	1,643	1,829
1944	252	1,623	1,875

Official statistics.

Hogs kept by cooperative pig clubs may be sold to the Ministry of Food, or a club may arrange for the slaughter of its own hogs and distribute the meat among its members. A license, however, must be obtained from the local Food Control Committee before any butchering is done. The pig clubs are producing 10,000 to 11,000 short tons of bacon annually. About 60 percent of this production is sold to the Ministry of Food.

Domestic production of pork and bacon is estimated to have declined about 60 or 65 percent from the prewar level. An increase in domestic production of fresh and cured pork, accompanied by a decline in imports of these products, paralleled the expansion of the country's hog population during the first half of the 1930's as a result of import restrictions. The official marketing arrangements for those commodities, from a long-range viewpoint, were, however, only partially successful, because during the latter half of the same decade, when hog numbers were almost stationary, imports increased.

Of assistance in relieving the pork and bacon shortage have been community or neighborhood pig clubs, membership in which is barred to commercial producers. Either each member of such a group keeps his own hog, or the club is run cooperatively with shared equipment and rented buildings. Sometimes the animals are cared for by a paid assistant. With the hogs fed chiefly on household scraps, a Small Pig Keepers' Council has furnished advice on that type of feeding, in particular, and has been able to obtain small rations of meal for registered clubs.

Table 3.—*United Kingdom pork supplies, 1930–39*

[Dressed weight, exc. offal]

Year	Domestic production		Total imports	Total supply	Imports from the United States
	Volume	Percentage of supply			
	Million pounds	*Percent*	*Million pounds*	*Million pounds*	*Million pounds*
1930	629	32.8	1,288	1,917	161
1931	697	32.6	1,438	2,135	98
1932	788	35.3	1,443	2,231	64
1933	822	40.3	1,217	2,039	80
1934	858	44.1	1,089	1,947	91
1935	979	49.9	983	1,962	58
1936	1,030	52.0	951	1,981	41
1937	1,019	50.8	986	2,005	38
1938	[1] 948	48.9	991	1,939	56
1939	[1] 938	48.3	1,004	1,942	63

[1] Unavailable for United Kingdom, but on basis of official reports for England and Wales, estimated for 1938 to be about 7 percent below 1937, with additional 1-percent decline in 1939 from 1938.
Official statistics.

In 1944–45, prices per score, dead weight, for fat hogs averaged £1 4s. (24 cents per pound) as had been the case since 1942–43. This figure represented only a slight increase over the 1941–42 average of £1 3s. 3d. (23 cents per pound) but a considerable rise from 17s. 9d. (18 cents per pound) and 17s. 8d. (17 cents per pound) prevailing in 1940–41 and 1939–40, respectively. The whole wartime price scale for fat hogs represents a gradual upward trend over the prewar period.

Official Postwar Plans

The tenor of numerous official and unofficial statements, as well as of those made by agricultural organizations, regarding postwar planning has been that the United Kingdom will consider shifting the emphasis at present placed on the production of grain and potatoes to that of livestock products.

Fairly rapid recovery, even if not greater-than-prewar expansion, of hog numbers seemed assured by the most recent Government decision on the matter. On April 21, 1945, an official announcement was that, in view of the favorable war situation and the prospective meat shortage, the Government had examined the possibility of encouraging expansion of hog production beyond the prevailing low level. As a consequence, a scale of increased feed rations for hogs was announced in the interest of improving the supply of domestic pork and bacon from early in 1946 onward. At present, rations are based on one-sixth of prewar numbers. From June to October, the basis will be raised to one-fifth; from November 1945 to April 1946, to one-fourth; and thereafter until further notice, to one-third.

The Ministry of Agriculture estimates that the changes will involve the feeding of 560,000 short tons more cereals and proteins for the remainder of this year. In 1946 the increase in such feedstuffs is expected to total from 1,120,000 to 1,680,000 short tons. The greater amounts of feed are expected to make about 1,500,000 more hogs available for slaughter in 1946 than in 1945. In addition to increasing the proportion of prewar herd numbers on which feed rations will be issued, a further decision was reached—to make no deductions after June 1945 from ration allowances to hog producers based on agricultural land occupied by the producers.

By way of additional incentive to increased production, beginning July 1, 1945, prices for fat hogs are being increased on an average of 1s. per score (1) cent per pound), dead weight, over the 1944–45 rate referred to above. Despite the protests of hog producers and other farm groups, however, the Government has not, to date, included hog prices in its 1944–48 guaranty of other livestock prices at not less than prevailing levels.

Although the Bacon Marketing Scheme was indefinitely suspended and the Pigs Marketing Scheme modified soon after the outbreak of war, the Pigs and Bacon Marketing Boards, as such, were not dissolved. Farm groups have advocated, and the Ministry of Agriculture has shown evidence of contemplating, the resumption by the Boards of their duties in the reasonably near future.

Unofficial efforts in the matter of postwar planning for hogs are being spear-headed by a Joint Committee to plan for the industry's future. This Committee was convened by the National Farmers' Unions on May 9, 1945. Its membership comprises representatives of the Pigs Marketing Board, British Pig Producers' Council, National Pig Breeders Association, and the Wartime Small Pig Keepers' Council in addition to National Farmers' Union delegates.

In order to be assured of sufficient pork and bacon supplies in the postwar period, while its hog numbers are being reconstituted, the United Kingdom has contracted to purchase the entire exportable pork surpluses of Australia and New Zealand until the end of September 1946 and such quantities thereafter as may be agreed upon. During the calendar year 1946, the United Kingdom has agreed to purchase from Canada a minimum of 450,000,000 pounds, as well as all additional bacon which that country may be able to supply. As the leaner and lighter cured bacon from Denmark and other western-European countries again becomes available, and as home production increases, imports into the United Kingdom of bacon and pork from non-European sources may be expected to show, as a whole, a marked decline.

Leaders among United Kingdom hog producers have, themselves, variously stated that the postwar success of the domestic industry depends essentially upon the degree to which it is able effectively to standardize pork- and bacon-type hogs, secure reduction of feedstuffs costs, and improve the efficiency of feeding and marketing techniques.

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